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PEZIZA FUSICARPA GER. AND PEZIZA SEMITOSTA B. & C.

ELIAS J. DURAND.

PEZIZA FUSICARPA Ger. is one of the common discomycetes of the eastern United States. The attractive bowl-shaped ascomata were among my earliest collections in the group, and have been ever since among my favorite objects of observation during the summer months. This continued interest has resulted in the accumulation of a large series of notes which I have been several times on the point of arranging for publication. This has seemed the more desirable because the available descriptions of *P. fusicarpa* and its allied forms are at best incomplete, and certain recent attempts at elaboration have introduced at least as many new elements of confusion as they have dispelled. Mr. Morgan's note on *Peziza pubida* B. & C., in the July number of this Journal has called up the matter once more, and the following contribution is offered in the hope of adding something to our knowledge of the species, and at the same time of clearing up what I believe to be certain misconceptions regarding some of our choicest fungi.

It may not be out of place to state at once that these observations are based on about 50 separate collections, besides numerous ungathered plants in the field. The individuals are occasionally so abundant on the rich sloping banks of ravines near Ithaca, that quarts of them may be gotten in some spots. The herbarium material studied includes the specimens of *P. fusicarpa* collected near Poughkeepsie by Gerard, and sent by him to Cooke to be figured in Mycographia (fig. 113), as well as other specimens from the same locality and collector in the Ellis Herbarium, at the New York Botanical Garden. Inasmuch as no one seems to know the whereabouts of Gerard's own herbarium, or even whether it is longer in existence, these two specimens must be regarded as the most authentic of the species to which access may be had.

Other specimens examined include *P. pubida* B. & C.: the type in Berkeley's herbarium at Kew; *P. semitosta* B. & C.: Berkeley's type at Kew, as well as a duplicate of Dr. Michener's original collection in the herbarium of Elias Fries, at Upsala. What appear to be portions of the types of both the last named species are also present in Massee's herbarium, now at the New York Botanical Garden.

Peziza morgani Mass. is represented by the type in Massee's herbarium as above, as well as by a specimen sent me by Mr. Morgan himself marked "type." Of *P. hainesii* Ell. the type and other examples so named in the Ellis Collection, at New York, have been studied.

My conclusions based upon a study of the material indicated may be stated briefly as follows: *Peziza fusicarpa* Ger. (1873), *P. pubida* B. & C. (1875), and *P. morgani* Mass. (1902) are specifically identical and synonymous; *P. semitosta* B. & C., while closely allied to *P. pubida* B. & C., is not identical with it, but is specificly distinct; *P. hainesii* Ell. (1881) is identical with *P. semitosta* B. & C. (1875), as recently stated by Ellis himself (Jour. Myc. 10: 170).

Whether these species shall be assigned to Lachnea or Macropodia of Saccardo's arrangement may be regarded as a matter of individual opinion. The descriptions indicate the presence or absence of a stem as the primary distinction between the genera. This is surely a most illusive character. *P. fusicarpa* shows great variability in this respect. Often in a single cluster one finds a range from cups absolutely sessile to those with stems of maximum size. An examination of hundreds of growing plants shows that one-half or two-thirds, perhaps, possess some sort of a stem. Lachnea as defined by Saccardo and others is certainly a complex which must be broken up. The name even must be abandoned for a genus of fungi. Macropodia Fckl. was based on a single species *M. macropus* (Pers.) Fckl., which is included by many writers in Helvella, a refernce which seems at least problematical. The excipular structure of the species here considered is quite different from that of most of the species of Lachnea, but corresponds more closely to that of *M. macropus.* The general pliable, leathery texture indicates further relationship with that species. In Macropodia, then, our plants may best be placed until the time when the whole group shall have been thoroughly worked over and revised in accordance with other and perhaps better bases of arrangement.

My ideas of the characters and specific limits of the two species may be gotten from the following descriptions.

MACROPODIA FUSICARPA (Ger.) Durand.

Peziza fusicarpa Ger., Bull Torr. Bot. Club 4: 64. 1873.
Peziza (*Sarcoscyphae*) *pubida* B. & C., Grev. 3: 153. 1875.
Macropodia pubida (B. & C.) Sacc., Syll. 8: 159. 1889.
Lachnea fusicarpa (Ger) Sacc., Syll. 8: 172. 1889.
Peziza velutina B. &. C. (ined.) in Curtis Bot. N. Car. 132. 1867.
Peziza morgani Mass., Journ. Myc. 8: 190. 1902.
Exsicc.: Ellis, N. A. F. n. 1269; E. & E., F. Col. n. 1307.
Illust.: Cooke, Mycog. *figs. 110, 113;* Grev. 3. *pl. 44. f. 226;* Seaver, Bull. Lab. Nat. Hist. Iowa 5, *pl. 20. f. 1.*

Plants solitary or gregarious, often densely so, sessile or stipitate; ascomata at first closed, then expanding until hemispherical-cupulate, the margin slightly incurved, occasionally becoming saucer-shaped; hymenium at first bluish-pallid or creamy-white changing to ochraceous, finally becoming dark brown when old or dry, externally slightly darker, velvety on account of the short bay-brown hairs, which are flexuous, rather thin-walled, obtuse, 1-4 (rarely more) septate, the segments somewhat irregular, about 100-250x20μ (rarely longer); plants variable in size, .5-4 cm. in diam., 1-2.5 cm. deep, fleshy-leathery, pliable, flesh thin; excipulum and hymenium equally thick, the former composed of two distinct layers of equal thickness: the ental one of interwoven hypae, 5μ thick, running more or less parallel to the sides of the cup; the ectal one parenchymatous, cells more or less quadrate, somewhat longer than broad, with rather thick walls, arranged in rows at right angles to the surface, some of the rows being continued outward to form the hairs; stem either entirely absent or up to 1.5 cm. high, .5-1 cm. thick, compressed, often longitudinally sulcate or puckered at the summit, velvety. Asci stout, cylindrical-clavate, apex rounded, not blue with iodine, 260-325x15-18μ; spores 8, obliquely uniseriate or rarely subbiseriate above, hyaline, continuous, fusiform, at maturity distinctly granular roughened, contents granular, 2-guttulate, straight or curved, 32-44x10-11μ (majority 36-41μ). Paraphyses cylindrical, septate, brown, slightly thickened above, 6-8μ thick.

On soil and humus, rarely on very rotten wood, in rich woods and on slopes of ravines, July to Sept. Ontario to Alabama and Iowa.

A common and characteristic, but variable species. The average diameter is about 2 cm., but specimens twice that size are not uncommon. Berkeley and Massee described their plants from dried material in which the hymenium is brown. Gerard, on the other hand, described the hymenium as "at first ochraceous, at length dark brown." The creamy or ochraceous tints are the ones most often seen, but in very fresh young specimens the color is paler resembling that of *Lachnea hemispherica.* As previously stated, about one-half to two-thirds of the ascomata possess some sort of a stem, and all variations may be seen in a single group. The length of the hairs also varies considerably, but those longer than 250 μ are rarely seen. The dried flesh when moistened up is distinctly leathery-gelatinous, but this character is not evident in the fresh state. The young spores are smooth and smaller than mature ones, the latter being distinctly roughened in all the examples I have seen. The shape is distinctly fusiform rather than elliptical-oblong as in the next species. They are very rarely as short as 33μ. In Gerard's collections of *P. fusicarpa* they measure 33-43x10-12μ; in the type of *P. pubida* 35-40x10μ, while those of the type of *P. morgani* are 35-40x10-11μ. The paraphyses are nearly colorless in young plants, but the contents soon become brownish, finally deep brown throughout — a change coordinate with the change in color of the hymenium from cream-color through ochraceous to brown.

The identity of *P. morgani* with *P. pubida* (as represented in Ellis, N. A. F. n. 1269) was first indicated by Mr. Seaver (l. c.), in 1904. He also later called attention to the fact that the specimen in Rab.-Winter, F. Eur. n. 3275, called *P. pubida* B. & C., is different, being smooth, and having different spores. Mr. Seaver's position is well taken, as I had already satisfied myself by examination of several copies including the one at Kew quoted by Massee. The specimens under that number belong to a species nearly allied to, if not identical with, *Peziza atrovinosa* Cke., the spores being elliptical, 15x8-9μ, rugose roughened, and brown when mature. This latter species is not uncommon in the eastern United States.

Peziza velutina B. & C. was mentioned by Curtis (l. c.), and was said by Cooke to be "undescribed and uncertain." Dr. Peck (Rep. 28:68) declared that according to specimens from Curtis it is the same as *P. fusicarpa* Ger. In the Kew Herbarium the name of the type specimen of *P. pubida* was first written "P. velutina B. & C.," then the "velutina" was lined out and "pubida" written above it. It seems probable, therefore, that Berkeley first thought of naming the species "P. velutina," and reported that name to Curtis (before 1867), but before publication (1875) decided to substitute the name pubida, which he did.

Material examined: ONTARIO: Hull, J. Macoun; Toronto, J. Dearness.

CONNECTICUT: Redding, F. S. Earle; Mt. Carmel, R. Thaxter.

NEW YORK: Poughkeepsie, W. R. Gerard; Ithaca, Durand et al.; Canandaigua, Durand; Honeoye, Durand.

PENNSYLVANIA: Bethlehem, E. A. Rau (Herb. Ellis); West Chester, Everhart and Haines.

WEST VIRGINIA: Nuttallburg, L. W. Nuttall.

ALABAMA: Peters.

OHIO: Preston, A. P. Morgan.

IOWA: Decorah, E. W. D. Holway; Iowa City and Mt. Pleasant, F. J. Seaver.

MACROPODIA SEMITOSTA (B. & C.) Sacc., Syll. 8:159.1889.
Peziza (*Sarcoscyphae*) *semitosta* B. & C., Grev. 3: 153.1875.
Peziza hainesii Ell., Bull. Torr. Bot. Club 8:65.1881
Lachnea hainesii (Ell.) Sacc., Syll. 8:186.1889.
Exsicc.: Ellis, N. A. F. n. 562; E. & E., N. A. F. n. 2740.

Illust.: Cooke, Mycog. *f. 109;* Grev. 3. *pl. 44. f. 225;* Jour. Linn. Soc. Bot. 31. *pl. 16. f. 19.*

Plants sessile or short stipitate, cupulate or urceolate, 2-4 cm. diam.; hymenium creamy-white when fresh becoming brown on drying; cup clothed externally with rufous brown hairs which are obtuse, up to 4-5-septate, scarcely constricted at the septa, rather thin walled, up to 350μ long, rarely longer; stem when present stout, more or less longitudinally plicate and sometimes lacunose below. Asci clavate-cylindrical, apex rounded, 300-325x15μ; spores uniseriate, hyaline, continuous, granular-roughened, elliptical to elliptical-oblong, 25-33x10-12μ (majority 28-32μ); paraphyses cylindrical, apex slightly thickened, septate, brown.

On rich woodland soil, burnt soil, or much decayed wood, Aug.-Oct. Pennsylvania and Delaware.

I have not seen this species in the fresh state and so can give no more information about it than can be gotten from herbarium material. It seems to agree in size, form, color, and certainly in the structure of the excipulum, with *M. fusicarpa,* the chief differences being found in the somewhat longer external hairs, and the shape and size of the spores. The latter are relatively much broader being elliptical or oblong-elliptical with rounded ends, rather than fusiform, and average 28-32μ long as against 36-41μ in *M. fusicarpa.* The largest spores of *M. semitosta* barely surpass the smallest ones of *M. fusicarpa.*

Dr. Michener's collections seem to be somewhat immature, but Mr. Ellis's material seems to be better developed. The spores present agree perfectly in all the specimens. In the type of *M. semitosta* they measure 25-33x10-12μ, while in that of *P. hainesii* they are 30-31x10-12μ.

Material examined: PENNSYLVANIA: Dr. Michener, n. 3936; West Chester, Haines and Jefferies.

DELAWARE: Wilmington, A. Commons.

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NOTES FROM MYCOLOGICAL LITERATURE XVII.

W. A. KELLERMAN.

SYMBIOSIS IN THE GENUS LOLIUM, E. M. FREEMAN, Minn. Bot. Studies, 3: 329-334, Oct. 18, 1904, admits that it cannot be affirmed without reservation that the entire life-history of L. temulentum is understood, but it can be affirmed that the yearly life-cycle is known, and that the parasite can live on indefinitely,